Clean version of the amended claims

1. A liquid crystal display comprising:

a first substrate;

a common electrode which is formed on the first substrate;

a plurality of protrusions formed on the common electrode;

a second substrate facing the first substrate; and

a pixel electrode having a plurality of apertures formed on the second substrate.

2. The liquid crystal display of claim 1, further comprising a chiral nematic liquid crystal layer having negative dielectric anisotropy which is interposed between the first and the second substrates.

3. The liquid crystal display of claim 2, further comprising two vertical alignment layers which are formed on inner surfaces of the first and the second substrates respectively and align the molecular axes of liquid crystal molecules in the liquid crystal layer in a direction perpendicular to the substrates.

4. The liquid crystal display of claim 1, further comprising a first and a second polarizers attached to outer surfaces of the first and the second substrates respectively, polarizing directions of the first and the second polarizers being perpendicular to each other.

5. The liquid crystal display of claim 4, further comprising a first compensation film attached either between the first substrate and the first polarizer or between the second substrate and the second polarizer.

6. The liquid crystal display of claim 5, wherein the first compensation film is a biaxial compensation film.

7. The liquid crystal display of claim 6, wherein a slow axis of the first compensation film is parallel or perpendicular to the polarizing directions of the first and the second polarizers.

8. The liquid crystal display of claim 5, further comprising a second compensation film attached either between the first substrates and the first polarizer or between the second substrate and the second polarizer.

9. The liquid crystal display of claim 8, wherein the first and the second compensation films are an a-plate and a c-plate compensation films respectively.

10. The liquid crystal display of claim 9, wherein a slow axis of the a-plate compensation film is parallel or perpendicular to the polarizing directions of the first and the second polarizers.

11. The liquid crystal display of claim 4, wherein the apertures have a shape of a wedge-shaped line having width.

12. The liquid crystal display of claim 4, wherein the protrusions have symmetrical cross sections, and have a shape of a wedge-shaped line having width, and the apertures and the protrusions are arranged alternately.

13. A liquid crystal display comprising:

a first substrate;

a common electrode which is formed on the first substrate;

a plurality of protrusions formed on the common electrode;

a second substrate facing the first substrate;

a pixel electrode having a plurality of apertures formed on the second substrate; and

a first and a second polarizers attached to outer surfaces of the first and the second substrates respectively, polarizing directions of the first and the second polarizers being perpendicular to each other;

wherein the protrusions have symmetrical cross sections, and have a shape of a wedge-shaped line having width, and the apertures and the protrusions are arranged alternately;

wherein the protrusion has a first branch extending along an edge of the pixel electrode from a position at which the aperture meets the edge of the pixel electrode with an acute angle.

14. The liquid crystal display of claim 13, wherein the width of the first branch decreases as goes from the protrusion to an end of the first branch.

15. The liquid crystal display of claim 14, wherein the protrusion has a second branch extending from a convex point of the protrusion toward the aperture; and

the apeture has an extension extending from a convex point of the aperture toward the protrusion.

16. The liquid crystal display of claim 15, wherein the width of the extension decreases as goes to an end of the extention; and

the width of the second branch decreases as goes to the edge of the pixel electrode.

17. The liquid crystal display of claim 12, wherein the polarizing directions of the first and the second polarizers make an angle of 45° with the aperture and the protrusion.

18. The liquid crystal display of claim 12, wherein the width of the aperture is 3 to 20 microns.

19. The liquid crystal display of claim 18, wherein the width of the protrusion is 3 to 20 microns.

20. The liquid crystal display of claim 19, wherein the distance between the aperture and the protrusion is 5 to 15 microns.

21. The liquid crystal display of claim 20, wherein the height of the protrusion is 0. 3 to 3 microns.

22. The liquid crystal display of claim 4, wherein the aperture has a shape of cross including a first and a second portions crossing each other at a right angle.

23. A liquid crystal display comprising:

a first substrate;

a common electrode which is formed on the first substrate;

a plurality of protrusions formed on the common electrode;

a second substrate facing the first substrate;

a pixel electrode having a plurality of apertures formed on the second substrate; and

a first and a second polarizers attached to outer surfaces of the first and the second substrates respectively, polarizing directions of the first and the second polarizers being perpendicular to each other;

wherein the aperture has a shape of cross including a first and a second portions crossing each other at a right angle,

wherein the shape of the protrusion is a tetragon surrounding the aperture.

24. The liquid crystal display of claim 23, wherein the width of the aperture decreases as goes from a center of the aperture to ends of the aperture.

25. The liquid crystal display of claim 24, wherein the center of the cross is diamond-shaped.

26. The liquid crystal display of claim 25, wherein the distance between the apertures is 10 to 50 microns.

27. The liquid crystal display of claim 22, wherein the first and the second portions are parallel to the polarizing axes of the first and the second polarizers respectively.

28. The liquid crystal display of claim 23, wherein the protrusion is located substantially outside edges of the pixel electrode.

29. The liquid crystal display of claim 23, wherein a portion of the protrusion overlaps edges of the pixel electrode.

30. The liquid crystal display of claim 4, wherein the aperture has an X shape including a first and a second portions crossing each other at a right angle.

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31. A liquid crystal display comprising:

a first substrate;

a common electrode which is formed on the first substrate;

a plurality of protrusions formed on the common electrode;

a second substrate facing the first substrate;

a pixel electrode having a plurality of apertures formed on the second substrate; and

a first and a second polarizers attached to outer surfaces of the first and the second substrates respectively, polarizing directions of the first and the second polarizers being perpendicular to each other,

wherein the aperture has an X shape including a first and a second portions crossing each other at a right angle,

wherein the protrusion surrounds the X shaped aperture.

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32. The liquid crystal display of claim 31, wherein the first and the second portions are parallel to the polarizing axes of the first and the second polarizers respectively.

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33. A liquid crystal display comprising:

a first substrate;

a common electrode which is formed on the first substrate;

a plurality of protrusions formed on the common electrode;

a second substrate facing the first substrate;

a pixel electrode having a plurality of apertures formed on the second substrate; and

a first and a second polarizers attached to outer surfaces of the first and the second substrates respectively, polarizing directions of the first and the second polarizers being perpendicular to each other,

wherein the aperture has an X shape including a first and a second portions crossing each other at a right angle,

wherein the protrusion is located substantially outside edges of the pixel electrode.

34. A liquid crystal display comprising:

a first substrate;

a common electrode which is formed on the first substrate;

a plurality of protrusions formed on the common electrode;

a second substrate facing the first substrate;

a pixel electrode having a plurality of apertures formed on the second substrate; and

a first and a second polarizers attached to outer surfaces of the first and the second substrates respectively, polarizing directions of the first and the second polarizers being perpendicular to each other,

wherein the aperture has an X shape including a first and a second portions crossing each other at a right angle,

wherein a portion of the protrusion overlaps edges of the pixel electrode.

35. The liquid crystal display of claim 1, wherein the protrusions are made of polyimide.

36. The liquid crystal display of claim 1, wherein the protrusions are made of photoresist.

37. The liquid crystal display of claim 1, further comprising a black matrix overlapping the protrusions on the second substrate.

38. The liquid crystal display of claim 37, further comprising a wire overlapping the aperture patterns on the first substrate.

39. The liquid crystal display of claim 38, wherein the wire is a gate wire.

40. A liquid crystal display comprising:

a first substrate including a pixel electrode having at least a wedge-shaped aperture; and

a second substrate which is opposite the first substrate and includes a common electrode and at least a wedge-shaped protrusion on the common electrode, the protrusion being parallel and alternate to the aperture.

41. A liquid crystal display comprising:

a first substrate including a pixel electrode having at least a wedge-shaped aperture; and

a second substrate which is opposite the first substrate and includes a common electrode and at least a wedge-shaped protrusion on the common electrode, the protrusion being parallel and alternate to the aperture;

a black matrix on the second substrate, the black matrix including a first portion overlapping the protrusion, a second portion passing through bent points of the protrusion the aperture and a third portion covering a region where the protrusion and the aperture meet a boundary of the pixel electrode.

42. The liquid crystal display of claim 41, wherein the black matrix further includes a fourth portion overlapping the protrusion.

43. The liquid crystal display of claim 41, wherein the third portion of the black matrix is triangular.

44. The liquid crystal display of claim 40, further comprising a wire overlapping the aperture on the first substrate.

45. The liquid crystal display of claim 44, wherein the wire is a gate wire.

46. The liquid crystal display of claim 40, wherein an edge of the pixel electrode between the aperture and the protrusion makes a right angle with the aperture.

47. A liquid crystal display comprising:

a first substrate;

a common electrode formed on the first substrate;

a plurality of protrusions formed on the common electrode;

a second substrate facing the first substrate;

a pixel electrode having a plurality of apertures formed on the second substrate; and

a liquid crystal layer having negative dielectric anisotropy which is interposed between the first substrate and the second substrate,

wherein the liquid crystal layer has four domains which have different tilt directions due to the apertures and the protrusions, and the long axes of molecules in the liquid crystal layer in the adjacent domains are perpendicular to each other.

48. A manufacturing method of a liquid crystal display comprising the steps of:

forming a plurality of protrusions a first substrate;

forming a pixel electrode having a plurality of apertures on a second substrate; and

assembling the first substrate and the second substrate such that the protrusions and the apertures are alternately arranged.

49. The manufacturing method of the liquid crystal display of claim 48, wherein the protrusions are made of photo-sensitive material.

50. The manufacturing method of the liquid crystal display of claim 49, wherein the step of forming the protrusions comprises the steps of:

coating a photo-sensitive film, exposing the photo-sensitive film, developing the photo-sensitive film, and baking the photo-sensitive film.

51. The manufacturing method of the liquid crystal display of claim 48, further comprising the step of forming vertical alignment layers on the first and the second substrates.

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52. (New) A liquid crystal display, comprising:

a first substrate having a plurality of pixel electrodes including a first electrode;

a second substrate opposite the first substrate and including a second electrode; and

a plurality of protrusions provided on at least one of the first and the second substrates, the plurality of protrusions including a first protrusion having a branch extending along an edge of the first electrode.

53. (New) The liquid crystal display of claim 52, wherein the plurality of protrusions are provided on the second substrate.

54. (New) The liquid crystal display of claim 53, further comprising a plurality of apertures provided on the first substrate and including a first aperture.

55. (New) The liquid crystal display of claim 54, wherein an edge of the first aperture is oblique to the edge of the first electrode, and an end of the first aperture is located near the edge of the first electrode.

56. (New) The liquid crystal display of claim 55, wherein the branch extends from the first protrusion toward the end of the first aperture.

57. (New) The liquid crystal display of claim 56, wherein the branch makes an acute angle with the edge of the first aperture.

58. (New) The liquid crystal display of claim 57, wherein the width of the branch decreases as goes from the first protrusion to the end of the first aperture.

59. (New) A liquid crystal display, comprising:

a first substrate having a plurality of pixel electrodes including a first electrode;

a second substrate opposite the first substrate and including a second electrode; and

a plurality of protrusions provided on at least one of the first and the second substrates, the plurality of protrusions including first and second protrusions having shapes of substantially straight lines,

wherein either the first and the second protrusions or imaginary extensions of the first and the second protrusions meet each other.

60. (New) The liquid crystal display of claim 59, wherein the first and the second protrusions are located substantially in an area corresponding to the first pixel electrode.

61. (New) The liquid crystal display of claim 60, wherein the first and the second protrusions are oblique to edges of the first pixel electrode.

62. (New) The liquid crystal display of claim 61, wherein the first and the second protrusions are substantially symmetrically arranged with respect to a first line substantially parallel to the edges of the first pixel electrode.

63. (New) The liquid crystal display of claim 62, wherein each of the first and the second protrusions has first and second ends opposite each other, and the first and the second protrusions either are separated from each other or meet only near the first ends of the first and the second protrusions.

64. (New) The liquid crystal display of claim 63, wherein the first pixel electrode has first to fourth principal edges, the first and the second principal edges are opposite and substantially parallel to each other, the third and the fourth principal edges are opposite and substantially parallel to each other, and the first and the second principal edges are shorter than the third and the fourth principal edges.

65. (New) The liquid crystal display of claim 64, wherein the first line is substantially parallel to the first and the second principal edges.

66. (New) The liquid crystal display of claim 65, wherein the first ends of the first and the second protrusions are located near the third principal edge.

67. (New) The liquid crystal display of claim 66, wherein the second ends of the first and the second protrusions are located near the first and the second principal edges, respectively.

68. (New) The liquid crystal display of claim 65, wherein the second ends of the first and the second protrusions are located near the fourth principal edge.

69. (New) The liquid crystal display of claim 68, wherein the first ends of the first and the second protrusions are located near the first line.

70. (New) The liquid crystal display of claim 69, wherein the plurality of protrusions includes a third protrusion extending from the first ends of the first and the second protrusions toward the third principal edge along the first line.

71. (New) The liquid crystal display of claim 70, wherein width of the third protrusion decreases as goes to the third principal edge.

72. (New) The liquid crystal display of claim 63, wherein the first and the second protrusions form a wedge shape.

73. (New) The liquid crystal display of claim 63, wherein at least one of the first and the second protrusions has a branch extending along an edge of the first pixel electrode.

74. (New) The liquid crystal display of claim 59, wherein one of the first the second electrodes has a plurality of apertures including first and second apertures having shapes of substantially straight lines.

75. (New) The liquid crystal display of claim 74, wherein the first and the second apertures are substantially parallel to at least one of the first and the second protrusions.

76. (New) The liquid crystal display of claim 75, wherein the first and the second apertures are substantially parallel to the first and the second protrusions, respectively.

77. (New) The liquid crystal display of claim 76, wherein the first and the second apertures are alternate to the first and the second protrusions, respectively.